

Amendments to the claims:

Cancel claims 15-35.

1 13. (Original) A method of making a read head that has an air bearing surface
2 (ABS) comprising the steps of:
3 forming a ferromagnetic first shield layer;
4 forming an antiferromagnetic pinning layer on the first shield layer;
5 forming a ferromagnetic pinned layer on and exchange coupled to the pinning layer so that
6 the pinning layer pins a magnetic moment of the pinned layer;
7 forming a nonmagnetic spacer layer on the pinned layer;
8 forming a first portion of a free layer on the spacer layer;
9 forming a nonmagnetic cap layer on the first portion of the free layer;
10 forming a mask on the cap layer with a width that defines a track width of the read head;
11 milling away exposed portions of the cap layer, a portion of the free layer, spacer layer and
12 pinned layer and backfilling with an electrically nonconductive antiferromagnetic material to form
13 first and second antiferromagnetic (AFM) layers interfacing first and second side surfaces of
14 remaining portions of the cap layer, a portion of the free layer, spacer layer and pinned layer;
15 removing the mask;
16 removing a remaining portion of the cap layer down to a remaining first portion of the free
17 layer;
18 forming a second portion of a free layer on the remaining first portion of the free layer and
19 on each of the first and second AFM layers; and
20 forming a ferromagnetic second shield layer on the second portion of the free layer.

1 14. (Original) A method of making a read head as claimed in claim 13 wherein
2 the first and second AFM layers are formed of nickel oxide.

15.- 35. (Canceled)

Add new claim 36.

36. (New) A method of making a magnetic head assembly comprising the steps of:
making a read head including the steps of:

forming a ferromagnetic first shield layer;

forming an antiferromagnetic pinning layer on the first shield layer;

forming a ferromagnetic pinned layer on and exchange coupled to the pinning layer

so that the pinning layer pins a magnetic moment of the pinned layer;

forming a nonmagnetic spacer layer on the pinned layer;

forming a first portion of a free layer on the spacer layer;

forming a nonmagnetic cap layer on the first portion of the free layer;

forming a mask on the cap layer with a width that defines a track width of the read
head;

milling away exposed portions of the cap layer, a portion of the free layer, spacer
layer and pinned layer and backfilling with an electrically nonconductive antiferromagnetic
material to form first and second antiferromagnetic (AFM) layers interfacing first and second
side surfaces of remaining portions of the cap layer, a portion of the free layer, spacer layer
and pinned layer;

removing the mask;

removing a remaining portion of the cap layer down to a remaining first portion of
the free layer;

forming a second portion of a free layer on the remaining first portion of the free layer
and on each of the first and second AFM layers; and

forming a ferromagnetic second shield layer on the second portion of the free layer;

making a write head including the steps of:

forming ferromagnetic first and second pole piece layers that have a yoke portion
between a pole tip portion and a back gap portion wherein the second pole piece layer
comprises said second shield layer;

forming a nonmagnetic write gap layer between the pole tip portions of the first and
second pole piece layers;

forming an insulation stack with at least one coil layer embedded therein between the
yoke portions of the first and second pole piece layers; and

connecting the first and second pole piece layers at their back gap portions.